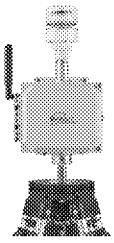
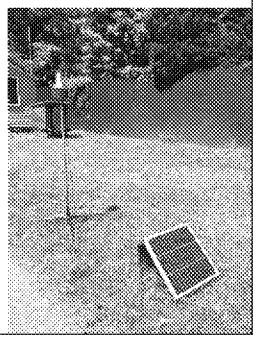
SPod Deployment Plan

Event Triggered Chloroprene Monitoring Around the Denka Performance Elastomer Site

SPod

- The SPod or Sensor Pod is a commercially available solar-powered sensor system comprised of existing proven technology:
  - Meteorological (MET) station to continuously measure wind speeds and directions;
  - Photoionization detector (PID) to continuously measure total VOC concentrations;
  - Canister sampling
  - Data processing





SPod Components

- MET
  - Fitted with an anemometer (Airmar WX-110 with humidity option) to measure wind speed, wind direction, and temperature.
  - Sensor to measure pressure, temperature, and RH. The SPod meteorological data is collected simultaneously with the SPod PID data.
- PID
  - SPod PIDs equipped with a 10.6 eV lamp and Ion Science MiniPID2 PID sensor. (spare Baseline Mocon® PID Sensor)
    - EPA has conducted testing to verify the lamp is responsive to chloroprene.
  - Detection sensitivity ranges from less than 0.001 ppm to > 40 ppm and responds to mixtures of VOCs usually present in fugitive plumes

SPod Components

- Canister Sampling
  - The SPods will include an automated sampling system that is triggered by the PID data to collect 24-hour time integrated air samples for EPA Method TO-15 analysis of chloroprene when an SPod's PID detects elevated total VOC concentrations.
    - The automated canister trigger system can accommodate up to four canisters at a time to allow multiple triggered events
  - Sample trigger concentrations will be determined by assessing the relationship between PID data and chloroprene concentrations in air samples.
- Data Processing
  - Data analysis method, MOP 3010
  - Baseline removal algorithms can be used to separate plume events from background changes and sensor drift

The overall objectives for the SPod monitoring project are:

1) To better understand the relationship between PID measured VOC concentrations and chloroprene concentrations measured in 24-hour canister samples.

2) To better understand the data processing necessary to evaluate VOC measurements

3) To help identify unknown or under-characterized emissions sources and activities in the Facility.

SPod Deployment Plan

- EPA will deploy six SPods at the six existing EPA air monitoring locations.
- The purpose of the monitoring is to identify time periods when ambient chloroprene concentrations are elevated.
- Deployment tentatively scheduled for February 18, 2020
- EPA has a Quality Assurance Project Plan (QAPP) for the SPod deployment under EPA's quality management system.
- EPA may seek information from Denka to evaluate compliance and identify opportunities for additional emissions reductions when sampling indicates chloroprene concentration are elevated.

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Distances from SPod Monitoring Sites to Denka Facility in LaPlace, LA

Site	Distance (m)	Distance (km)	Distance (miles)
[illegible]	943.20	0.94	0.59
[illegible]	1375.78	1.38	0.85
[illegible]	2529.70	2.53	1.57
[illegible]	941.59	0.94	0.59
[illegible]	530.34	0.53	0.33
[illegible]	1832.73	1.83	1.14

- Following pre-deployment QA testing, field testing near the Denka plant will include two phases:
  - The Initial phase consists of six SPods deployed for approximately two months. The data gathered in this phase will be processed and used to assess the sampling equipment performance and develop a trigger concentration for canister samples and averaging period for that concentration.
  - The Sampling phase consists of six SPods deployed for up to four months. During this phase, the plan is to collect continuous SPod data and collect event triggered 24-hour canister samples. The trigger concentration is subject to change as more data becomes available. The entire project will be evaluated monthly to determine if it should continue for a longer duration and estimate how much more sample collection time will be required.

Summary of Field SPOD QA/QC Procedures

Parameter	Acceptance Criteria	Method Procedures / Corrective Action	Frequency
Verify proper SPod set up	Completion of SPod Field Deployment Form, items 1-20	Execute MOP 3010 Section 4.6 / If during installation test, specific sensors are found to be non-operational, consult with field lead on corrective actions	Once at installation, then monthly during study
Periodic SPod PID check (bump tests)	Positive deflection of baseline with each of 3 bump tests; agreement in amplitude of baseline deflection within ±25%*; completion of SPod Field Deployment Form or ERG generated form	Execute MOP 3010 Section 4.6.3.7 / If during check specific sensors are found to be non-operational, consult with field lead on corrective actions	Once at installation, monthly during study, and at end of study
Data Screen	Completion of SPod Data Analysis Review Form, items 1-11 (or digital equivalent)	Execute MOP 3010 Section 4.6/ No corrective action is required	Daily (or other frequency specified by project lead) for days data is acquired
Wind Measurement Check	Reasonableness (±40%) compared to independent values	Perform reasonableness check by comparing acquired data between SPods and NWS / if found problematic, exclude data or flag as an estimated measurement	10% review once per month
Method Comparison Check	Reasonableness of PID data compared to associated canister sample values (±50%*)	Perform reasonableness check by comparing elevated PID data to associated canister samples, if applicable / if found problematic, check for larger changes in wind direction or RH, and PID drop out.	As available
Data Co-location Check	Reasonableness of PID data compared to any co-located SPod values (±40%COV)	Co-located: Perform reasonableness check by comparing SPod ppb PID data between any collocated SPods. During data processing perform reasonableness check by: • Comparing Bump Test results between paired SPods, • Comparing measured concentrations where both paired units measure concentrations above 40ppb, or a later defined value. If values do not compare reasonably a second comparison will be considered using the raw mV readings between the paired SPods. The next bump test or another point of comparison will also be considered to declare data back within reason. All data from the point of the failing comparison to the next passing comparison will be flagged as an estimate.	As available per bump test or weekly paired measurement comparison. Only for collocated SPods.
PID Check	Reasonableness compared to other SPod values (±50% COV)	Perform reasonableness check by comparing calculated PID results (ppb) across all Sensit SPod systems under certain "calm" overnight atmospheric conditions. This would help ensure the PIDs are not being individually affected by temperature or humidity.	Once per month
Heater Check	Reasonableness check that Sensit SPod PID heater is controlling temperature.	Determined during Pre-deployment testing by assessing heater output in data.	Pre-Deployment or when heater control is in question due to data observation.
Can Trigger Check (Pre-Deployment)	Leak check: <1.0" Hg in 48 hrs Verify system trigger command works	Perform leak check on trigger system for 48 hours, and send manual trigger to verify operation of system	Once before deployment
Can Trigger Leak Check (Deployed)	Leak check: <1.0" Hg in 1 minute	Perform leak check on trigger system for 1 minute.	At each canister deployment in the field.
Can Trigger "False Trigger"	Assessment to ensure canister trigger is functioning appropriately	Site operators would need to manually trigger a canister collection at the site to ensure the canister trigger is functioning and can collect a canister sample.	In the event that the data file denotes the SPod triggered a canister collection but the canister did not actually collect. Only necessary on incident